

SECTION 16341

PAD-MOUNTED SWITCH ROUGH-IN

LANL MASTER CONSTRUCTION SPECIFICATION

Edit this specification to suit Project requirements. Add project-specific requirements and delete those portions that do not apply to the work (e.g., a sub-system that does not apply). To seek a variance from applicable requirements, contact the ESM Electrical POC. Refer to http://www.lanl.gov/f6stds/pubf6stds/engrman/HTML/poc_techcom1.htm#elec for the LANL Engineering Standards Manual (ESM) Personnel Link Index.

When assembling a specification package, include applicable specifications from all Divisions, especially Division 1, General Requirements.

Delete information within "stars" during editing.

This specification developed for ML-3 / ML-4 projects. For ML-1 or ML-2 projects additional requirements and QA reviews are required.

For the purposes of this Section, a "pad-mounted switch" consists of a single self-supporting enclosure containing up to four medium-voltage interrupter switches. Refer to ESM Chapter 7, Section G4010, Part 7.0 for additional information.

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Furnish and install rough-in for pad-mounted medium-voltage switch including the following:

Edit the following article to match project requirements; pad mounted medium-voltage switch will be installed on either a manhole or on a concrete pad adjacent to an existing manhole. Refer to

1. [Concrete pad.] [Manhole.]
2. Underground ductbank for medium-voltage cables.
3. Grounding provisions.

1.2 LANL WORK

- A. LANL will furnish, install, and test pad mounted medium-voltage switch.
- B. LANL will furnish, install, terminate, and test medium-voltage cables.

1.3 SUBMITTALS

- A. Construction Submittals: None

1.4 QUALITY ASSURANCE

- A. Comply with the requirements of the *National Electrical Code* and IEEE C2 *National Electrical Safety Code*.

1.5 SEQUENCING AND SCHEDULING

- A. Coordinate rough-in for medium-voltage pad-mounted switch with the LANL Support Services Subcontractor.

Edit the following article to match project requirements; pad mounted medium-voltage switch will be installed on either a manhole or on a concrete pad adjacent to an existing manhole. Delete article if switch will be installed on a manhole.

- B. Schedule an inspection of the concrete pad before concrete is placed.

PART 2 PRODUCTS

2.1 PAD-MOUNTED MEDIUM-VOLTAGE SWITCH (GFE)

- A. The LANL Support Services Subcontractor (KSL) will furnish tamperproof and weatherproof pad-mounted medium-voltage switch that will comply with IEEE C37.74 *IEEE Standard Requirements for Subsurface, Vault, and Pad-Mounted Load-Interrupter Switchgear and Fused Load-Interrupter Switchgear for Alternating Current Systems Up to 38 kV*.

Edit the following articles to match Project requirements. Pad-mounted switch unit will either be mounted on top of an electrical distribution manhole (standard for new construction) or on a concrete pad adjacent to an existing electrical distribution manhole. If switch will be mounted on a manhole, retain clause 2.2 and delete clauses 2.3 through 2.5. If switch will be mounted on a concrete pad, delete clause 2.2 and retain clauses 2.3 through 2.5.

2.2 MANHOLE

Edit the following article to match Project requirements. Refer to Drawings ST-G4010-36 and ST-G4010-37 in Chapter 7 of the LANL ESM.

- A. Provide manhole with cover designed for mounting [one] [two] medium-voltage pad mounted switch unit[s].
- B. Refer to Section 02585 Underground Ductbank System.

2.3 CONCRETE FORMWORK

Edit the following article to match specification sections used in Division 3.

- A. Refer to Section [03100 *Concrete Formwork*] [03300 *Reinforced Concrete*].

2.4 CONCRETE REINFORCEMENT

- A. Use ASTM A615 Grade 60 reinforcing steel bars in medium-voltage switch concrete pad.

Edit the following article to match specification sections used in Division 3.

- B. Refer to Section [03200 *Concrete Reinforcement*] [03300 *Reinforced Concrete*].

2.5 CAST-IN-PLACE CONCRETE

- A. For medium-voltage switch pad use concrete with minimum 3000 lb per sq ft strength, 4 to 6 percent entrained air, 3/4 inch maximum size aggregate.

Edit the following article to match specification sections used in Division 3.

- B. Refer to Section 03310 *Cast-In Place Concrete*] [03300 *Reinforced Concrete*].

2.6 UNDERGROUND DUCTBANKS AND MANHOLES

- A. Refer to Section 02585 *Underground Ductbank System*.

2.7 GROUNDING

- A. Refer to Section 16060 *Grounding and Bonding*.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine surfaces and conditions, with Installer present, for compliance with installation tolerances and other conditions affecting rough-in for pad-mounted medium-voltage switch. Do not proceed with installation until unsatisfactory conditions have been corrected.

Edit the following articles to match Project requirements. Pad-mounted switch unit will either be mounted on top of an electrical distribution manhole (standard for new construction) or on a concrete pad adjacent to an existing electrical distribution manhole. If switch will be mounted on a manhole, retain clause 3.3 and delete clause 3.4. If switch will be mounted on a concrete pad, delete clause 3.3 and retain clause 3.4.

3.2 MANHOLE

- A. Refer to Section 02585 *Underground Ductbank System*.

3.3 CONCRETE PAD INSTALLATION

Project-specific pad-mounted switch pad construction details should be included in the Drawings.

- A. Install reinforced concrete pad of suitable dimensions for pad-mounted medium-voltage switch.
- B. Prepare level, compacted pad site in accordance with Section 02310 *Grading, Excavating, and Trenching*.

Edit the following article to match specification sections used in Division 3 and project requirements. A more substantial perimeter beam may be dictated by geotechnical conditions.

- C. Form medium-voltage switch pad in accordance with Section [03100] [03300].
 - 1. Provide perimeter turn down beam that is not less than 8 inches wide and extends not less than 12 inches below grade.

Edit the following article to match specification sections used in Division 3.

- D. Reinforce medium-voltage switch pad in accordance with Section [03200] [03300] and as detailed on the Drawings.
 - 1. Extend reinforcing into perimeter beam.
 - 2. Provide not less than 2 inches of concrete cover over reinforcing steel.

Edit the following article to match specification sections used in Division 3.

- E. Place concrete in accordance with Section [03310] [03300]. Provide wood float finish with no depressions.
 - 1. Chamfer top edges and corners.
 - 2. Cure concrete not less than seven days before installing equipment.
- F. Install not less than four 5/8 inch diameter galvanized steel anchor bolts set at least 4 inches into pad to anchor pad-mounted switch to pad.

3.4 DUCT INSTALLATION

- A. Terminate medium-voltage ducts in the switch compartment areas of the medium-voltage switch pad as indicated on the Drawings.
- B. Install 6-inch concrete-encased duct from below each switch compartment at the switch pad to within 3 ft of existing manhole. The LANL Support Services Subcontractor will extend ducts into existing manhole.

- C. Refer to Section 02585 *Underground Ductbank System* for installation requirements.
- D. Terminate each duct with a bell end fitting set 2 inches above the top of the concrete pad.

3.5 GROUNDING

- A. Terminate medium-voltage duct bank ground cables in switch compartment area of the medium-voltage switch pad. Provide compression ground lug to connect ground cable to medium-voltage switch ground pad in the switch compartment.
- B. Refer to Section 16060 Grounding and Bonding for installation requirements.

Edit the following article to match project requirements; pad mounted medium-voltage switch will be installed on either a manhole or on a concrete pad adjacent to an existing manhole. Delete article if switch will be installed on a manhole.

3.6 FIELD QUALITY CONTROL

- A. After switch pad is formed, conduits are installed, reinforcing bars are installed, but before concrete is placed, notify the LANL Support Services Subcontractor.
- B. Allow 3 working days in schedule for inspection by the LANL Support Services Subcontractor.
- C. Correct deficiencies noted before placing concrete.

3.7 MEDIUM-VOLTAGE SWITCH INSTALLATION

- A. The LANL Support Services Contractor will install the pad-mounted medium-voltage switch on the concrete pad.
- B. The LANL Support Services Contractor will install, test, and terminate the medium-voltage cables.

END OF SECTION

Do not delete the following reference information.

FOR LANL USE ONLY

This project specification is based on LANL Master Construction Specification Section 16341 Rev. 0, September 17, 2004.